

CLAIMS

1. A copolymer having polyamide blocks and polyether blocks, in which:
  - the polyether blocks essentially consist of PTMG having a  
5 number-average molar mass  $\overline{M}_n$  of between 200 and 4000 g/mol;
  - the polyamide blocks are formed from a linear (noncyclic, nonbranched) aliphatic predominantly semicrystalline monomer and from a sufficient amount of at least one comonomer to reduce their crystallinity, while remaining immiscible with the polyether amorphous blocks; and  
10 - the shore D hardness is between 20 and 70.
2. The copolymer as claimed in claim 1, in which the predominantly semicrystalline monomer is chosen from 11-aminoundecanoic acid and lauryllactam.  
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3. The copolymer as claimed in claim 1, in which the predominantly semicrystalline monomer is a diamine associated with a diacid, both these being aliphatic and linear.
- 20 4. The copolymer as claimed in claim 3, in which the aliphatic diamine has from 6 to 12 carbon atoms and the aliphatic diacid has from 9 to 12 carbon atoms.
5. The copolymer as claimed in any one of the preceding claims, in which  
25 the comonomer introduced in order to reduce the crystallinity is a lactam, an alpha, omega-aminocarboxylic acid or a cyclic diamine associated with a diacid.
6. The copolymer as claimed in any one of the preceding claims, in which the polyamide blocks are formed from lactam 12 (predominantly crystalline) and  
30 IPD 10 (isophorone diamine and sebacic acid).

7. The copolymer as claimed in any one of claims 1 to 5, in which the polyamide blocks are formed from lactam 12 (predominantly crystalline) and from PACM 12 (PACM 20 and C<sub>12</sub> diacid).
- 5 8. The copolymer as claimed in any one of claims 1 to 5, in which the polyamide blocks are formed from lactam 12 (predominantly crystalline) and either lactam 6 or 11-amino-undecanoic acid or lactam 6 and 11-amino-undecanoic acid.
- 10 9. The copolymer as claimed in any one of the preceding claims, in which the crystalline monomer represents at least 55%, and preferably at least 70%, by weight of the constituents of the polyamide blocks.
- 15 10. The copolymer as claimed in any one of the preceding claims, in which the amount of polyether blocks is from 10 to 40% by weight of the copolymer.
11. The copolymer as claimed in any one of the preceding claims, in which the mass  $\overline{M}_n$  of the polyether blocks is advantageously between 300 and 1100.
- 20 12. The copolymer as claimed in any one of the preceding claims, in which the Shore D hardness is between 40 and 70.
13. An article manufactured with the copolymers as claimed in any one of the preceding claims.